CLAIMS

1. An apparatus for analysing systems, the apparatus comprising an architecture storing means for storing architecture information about the architecture of the system, and evaluation means for evaluating the architecture in terms of non-functional requirements of the system, utilising the architecture information.

2. An apparatus in accordance with claim 1, wherein the system is a computing system.

3. An apparatus in accordance with claims 2, wherein the non-functional requirement includes performance, and the evaluation means includes means for evaluating performance of the complex system.

4. An apparatus in accordance with claims 1, 2 or 3 further comprising an architecture obtaining means for obtaining architecture information about the system.

5. An apparatus in accordance with claim 4, wherein the architecture obtaining means includes an interface which enables the architecture information to be obtained and loaded into the architecture storing means via a visual representation of an architectural model.

6. An apparatus in accordance with claim 5, wherein the architectural model is a hierarchical tree structure.

7. An apparatus in accordance with any one the preceding claims, being arranged to represent the stored architecture information as an architectural model, the architectural model including "Components" and "Connections" between the Components, wherein Components are entities within the system and Connections are bonds or relations between Components.

8. An apparatus in accordance with claim 7, wherein Components and Connections may have properties.

9. An apparatus in accordance with claim 7 or claim 8, wherein the Components and Connections include values, for data and/or functional and behavioural parameters.

10. An apparatus in accordance with claim 7, claim 8 or claim 9, wherein Components and Connections may include Sub-Components and Sub-connections.

10. An apparatus in accordance with any one of claims 7 to 10, the model further comprising Ports, Ports being arranged to connect Components and Connections.

11. An apparatus in accordance with claim 11, wherein each Connection Port can only be attached to one Component Port.

12. An apparatus in accordance to any one of claims 7 to 12 wherein Connections are first order entities, being recognised as equally important in the model as Components.

13. An apparatus in accordance with any one of claims 7 to 13, wherein Components and/or Connections may be designated as a certain Type.

14. An apparatus in accordance with any one of claims 7 to 14, wherein Components may be designated as Devices, Devices having processing Capacity.

15. An apparatus in accordance with claim 15, wherein Devices are shared between Components requiring processing capacity.

16. An apparatus in accordance with any one of claims 10 to 16, wherein any Component at any level of the hierarchy can be attached via a Connection to any other (or the same) Component and any other (or the same) level of the hierarchy.

17. An apparatus in accordance with any one of claims 8 to 17, the model for the comprising Implementations including groups of standard Properties collected under a name, standard Implementation and which may be related to multiple Components or Connections.

18. An apparatus in accordance with any one of the preceding claims, further including visualisation means for providing a visual representation of the system architecture from the stored architecture information. An apparatus in accordance with claim 19, wherein the

visualisation means is arranged to provide a visual representation in the form of a hierarchical three dimensional view.

19. An apparatus in accordance with claim 20 wherein the three dimensional view includes components represented as objects and connections represented as connections between the objects, and wherein an object may include, represented within the object space, further components and connections in the system which are of a lower hierarchy within the architecture.

20. An apparatus in accordance with claim 21, wherein the visualisation means enables a user to manipulate the three dimensional model in order to access different hierarchy levels.

21. An apparatus in accordance with any one of claims 19 to 22, wherein the visualisation means enables the user to manipulate the three dimensional view to see it from different perspectives.

22. An apparatus in accordance with any one of claims 19 to 23, wherein the visualisation means is arranged to provide the visual representation in the form of a hierarchical tree view.

23. An apparatus in accordance with any one of claims 19 to 24, wherein the visualisation means is arranged to provide a plurality of different visual representations, whereby the architecture of the complex system can be viewed from a plurality of different perspectives.

24. An apparatus in accordance with any one of the preceding claims, wherein the evaluation means includes a simulation means arranged to utilise the architecture model to simulate operation of the system, whereby the system operation may be evaluated.

25. An apparatus in accordance with any one of the preceding claims, wherein the architecture storing means is arranged to store a plurality of different levels of abstraction of the architecture, and wherein the apparatus enables a user to view the architecture at any of the

plurality of levels.

26. An apparatus in accordance with any one of the preceding claims, including capability space diagram generating means for generating capability space representations, providing a model of required system capability with respect to systems requirements properties.

27. An apparatus in accordance with claim 28, wherein the capability space representation includes a frame reference axis drawn from the properties that comprise the systems functional schema model.

28. An apparatus in accordance with claim 29, wherein the capability space diagram has more than two dimensions.

29. An architectural model for representing the architecture of a complex system the architecture model comprising Components and Connections between the Components, wherein Components are entities within the system and Connections are bonds or relation between Components.

30. An architectural model in accordance with claim 31, implemented by appropriate software and/or hardware.

31. An evaluator for evaluating characteristics of a system, the evaluator utilising the architectural model of claims 31 or 32 to implement a simulation of a characteristic of a model system.

32. An evaluator in accordance with claim 33, the characteristic being simulated being performance of the complex system.

33. An obtaining means for obtaining architectural information about a system, the obtaining means comprising an interface which enables architecture information to be input in accordance with an architectural model.

34. An obtaining means in accordance in with claim 35, wherein the architectural model is a hierarchical tree structure.

35. A method of analysing systems, comprising the steps of obtaining architecture information about the

architecture of the system, and evaluating the architecture in terms of non-functional requirements of the system, utilising the architecture information.

36. A method in accordance with claim 36, wherein the system is a computing system.

37. A method in accordance with claim 37, wherein a non-functional requirement is evolvability, and the step of evaluating the system includes the step of evaluating the evolvability.

38. A method in accordance with any one of claims 37 to 39, wherein a non-functional requirement is performance, and the step of evaluating the system includes the step of evaluating performance.

39. A method according to any one of claims 37 to 40 further including the step of storing the architecture information represented as "components", and "connections" between the components.

40. A method according to claim 41, wherein the components include information on data, functional and behavioural parameters of the components and the connections include information on data, functional and behavioural parameters of the connections.

41. A method according to either claim 41 or claim 42 wherein the components include "ports" connecting to connections.

42. A method according to any one of claims 41 to 43 wherein the components include Devices which may be utilised in the system.

43. A method in accordance with any one of claims 37 to 44, wherein the architecture information also includes information on constraints of the system.

44. A method in accordance with any one of claims 37 to 45, comprising the further step of providing a visual representation of the system based on the obtained architecture information.

45. A method in accordance with claim 46, wherein the step of providing the visualisation includes the step of

providing a hierarchical three dimensional view.

46. A method in accordance with claim 47 wherein the three dimensional view includes components represented as objects and connections represented as connections between the objects, and wherein an object may include, represented within the object space, further components and connections in the system which are of a lower hierarchy within the architecture.

47. A method in accordance with claim 48, further including the step of enabling a user to manipulate the three dimensional model in order to access different hierarchy levels.

48. A method in accordance with any one of claims 47 to 49 further including the step of enabling a user to manipulate the three dimensional view to see it from different perspectives.

49. A method in accordance with any one of claims 46 to 50, wherein the step of providing the visualisation includes the step of providing a three dimensional tree view.

50. A method in accordance with claims 46 to 51, wherein the step of providing a visual representation includes the step of providing a plurality of different visual representations so that the system can be viewed from the plurality of different perspectives.

51. A method according to any one of claims 37 to 52 wherein the step of evaluating the architecture includes the step of utilising the architecture information to simulate operation of the system, whereby the system operation may be evaluated.

52. A method in accordance with claim 53, further including the step of enabling re-modelling of the stored architecture information to provide an amended architecture, whereby the amended architecture may be evaluated in terms of non-functional requirements.

53. A method in accordance with any one of claims 37 to 54 further including the steps of storing a plurality of

different levels of abstraction of the architecture, and enabling a user to view the architecture at any of the plurality of levels.

54. A method in accordance with any one of claims 37 to 55 wherein the architecture information is obtained from a representation of a visualisation of an architecture.

55. A method in accordance with any one of claims 37 to 56 further including the steps of generating capability space representations, and providing a model of required system capability with respect to systems requirements properties.

56. A method in accordance with claim 57, wherein the capability space representation includes a frame reference axis drawn from the properties that comprise the systems functional schema model.

57. A method in accordance with claim 50, wherein the capability space diagram has more than two dimensions.

58. A method of evaluating a system, comprising the steps of utilising an apparatus in accordance with any one of claims 1 to 30 to model the architecture of the system and to evaluate the system in terms of non-functional requirements of the system, utilising the architectural information that has been modelled.

59. A method in accordance with claim 60, including the further step of proposing changes to the architectural model and re-evaluating.

60. A method in accordance with claim 61, comprising the further step of engineering the changes into the system.

61. A method of developing a system, utilising the apparatus of any of claims 1 to 30, comprising the steps of defining a complex system architecture and modelling the architecture utilising the system of any one of claims 1 to 30, and evaluating the system architecture in terms of non-functional requirements it is proposed to meet.

62. A method in accordance with claim 63, comprising the further step of proposing changes to the architectural model and re-evaluating.

63. A method in accordance with claim 64, comprising the further step of engineering the system in accordance with the architecture that has been modelled.

64. A computer program arranged, when loaded onto a computing system, to control the computing system to implement a system in accordance with any one of claims 1 to 30.

65. A computer readable medium providing a computer program in accordance with claim 60.

66. A method for analysing a complex system, the method comprising the steps of determining an architecture of the complex system, and evaluating the architecture in terms of non-functional requirements of the system, utilising the determined architecture.

67. A method in accordance with claim 68, wherein the step of determining the architecture, includes the step of determining the architecture at a plurality of levels of abstraction, each level of abstraction providing a different level of architecture information for evaluation of the complex system.

68. A method in accordance with claim 67, wherein the step of providing a plurality of levels of architecture information comprises the step of providing an essential architecture and an implementation architecture.

69. A method in accordance with claims 67 or 68, wherein the step of providing a plurality of levels of architecture information includes the step of providing an intermediate architecture.

70. A method in accordance with claim 70, wherein the step of determining the intermediate architecture comprises the steps of determining a plurality of intermediate architectures.

71. A method in accordance with any one of claims 66 to 63, wherein the step of evaluating the complex system includes the steps of providing a representation of a capability space that the complex system is to work within, the capability space comprising a capability